

## Summary of City Hall Solar Canopy Installment - Energy Resiliency

The installation of a 21 KW DC battery storage photovoltaic canopy structure installed on the top level of the New Orleans City Hall parking garage located on Poydras Street. We will not only aid in the city's resiliency effort but design and display the cities first of its kind renewable energy solution. This will be a shining example of the city's innovative culture. By partnering with industry leaders in manufacturing, PosiGen, the region's largest solar installer, will develop and manage the complete installation effort of this project.

### Highlights of project:

- Beautiful Design
- Backup Storage and on demand power source for specific loads when grid power is unavailable
- Reduce energy expenditures
- Retrofit existing parking spaces with zero impact to the current lot size

### In this project document:

- System Mockup & Shade Analysis
- System Production Estimate
- 3D Renderings
- Engineered Drawings
- Installation Specifications
- Strategic partners and Vendors
- Equipment Specifications

**Owner:**

City of New Orleans, Office of Facilities  
Infrastructure and Community Development Capital Projects Administration  
1300 Perdido Street, Ste: 6E15, New Orleans, LA 70112

**Architects:**

Murphy, Makofsky, Inc  
Consulting Engineers  
336 N. Jefferson Davis Pkwy.  
New Orleans, Louisiana 70119  
[J\\_sofranko@mimi-eng.com](mailto:J_sofranko@mimi-eng.com)

Caruso Turley Scott  
Structural Engineers  
1215 W. Rio Salado Pkwy.  
Tempe, Arizona 85281  
[psscott@ctsaz.com](mailto:psscott@ctsaz.com)

**Project Data:**

Total parking garage site area: 31328sf  
Solar canopy area: 1382.1 sf.



VICINITY MAP

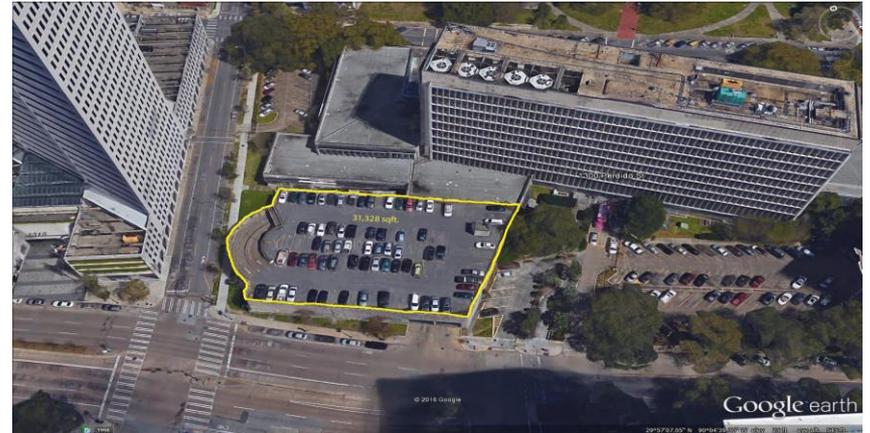
**Canopy Manufacturer:**

Orion Solar Racking  
2917 Vail Avenue  
Commerce, CA 90040  
[mona@orionracking.com](mailto:mona@orionracking.com)

The scope of this project includes:

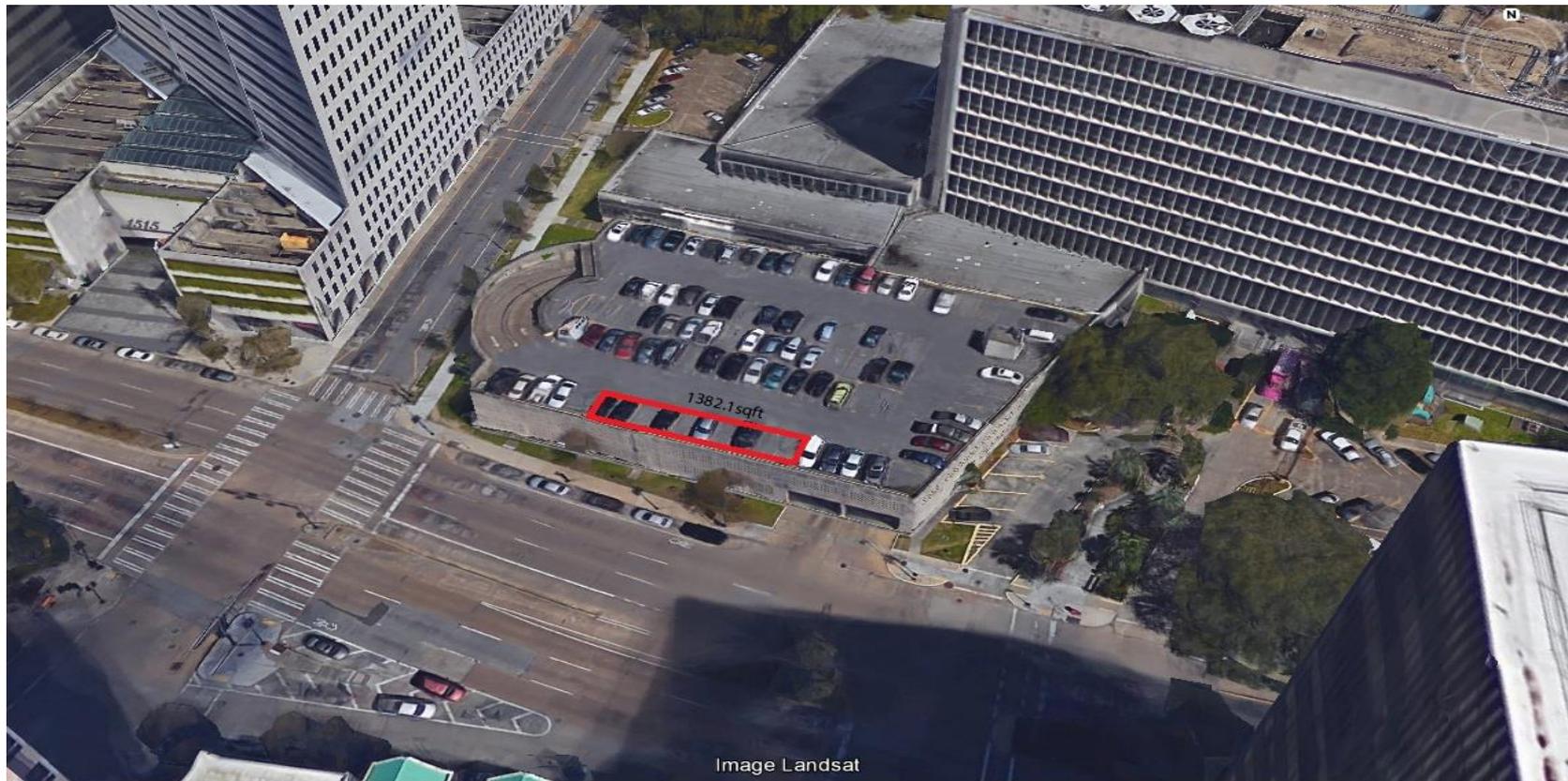
Retrofitting the Poydras street parking garage to accommodate the construction and installation of 75 solar modules on a 81.3 x 17 canopy facing Poydras Street.

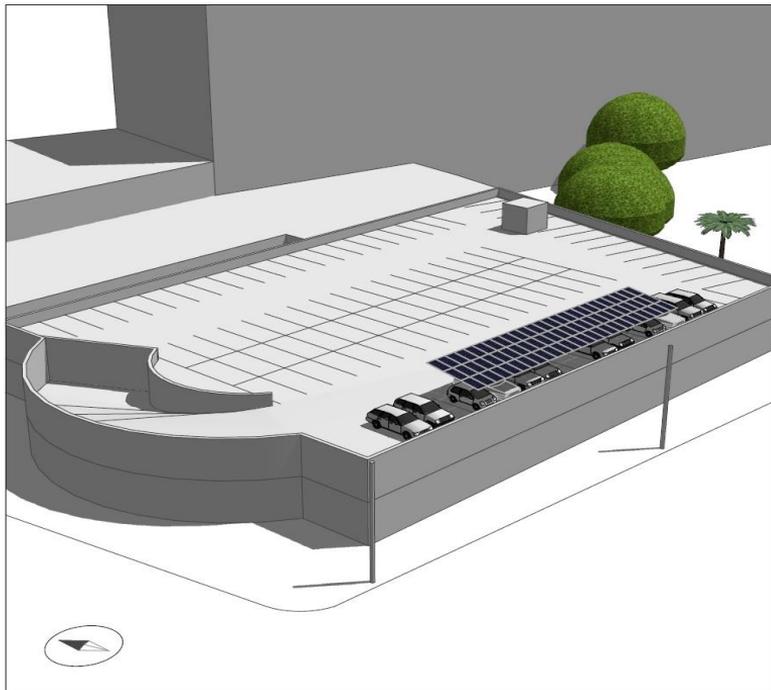
Equipment such as electrical panels, disconnects, solar inverters, and conduit will be placed on the back side of existing freight elevator structure.



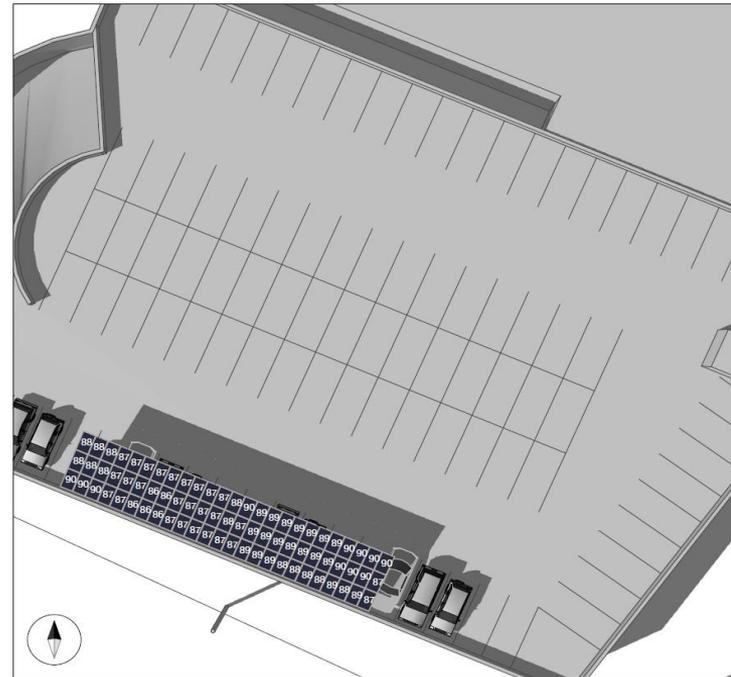
BUILDING SITE

## Exact Panel Location on Parking Garage





MARKUP VIEW OF CANOPY



AERIAL VIEW OF MODULE PRODUCTION

Key Points:

- 21kW DC PV System
- 75 panels
- Silfab 280w panels



## 21 kW DC PV SYSTEM

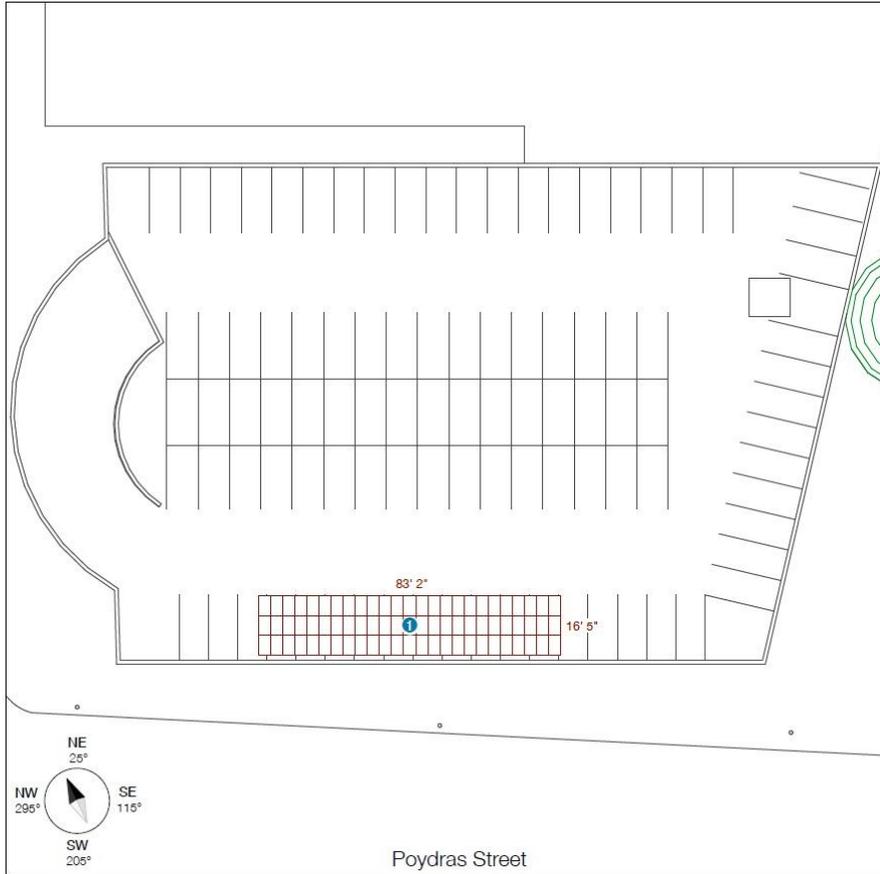
### Option 2

75 280W Solar PV Panels  
Silfab: SLA280M

## CITY HALL CANOPY PROPOSAL

Poydras Street  
New Orleans, LA 70112

Array	Modules	Azimuth	Tilt	Yield kWh/kW/yr
1	75	205° SW	10°	1,074



Approved by \_\_\_\_\_

## SITE PLAN

Contractor is responsible for verifying all on-site conditions and measurements, complying with local and national code requirements and manufacturers' manuals.

Drawn: MH. Checked: BHS.  
Date: 8/11/2016 Rev3  
Sheet size: 8.5" x 11"  
Scale: 1" = 30' (1:360)

## Key Points:

- Proposed canopy design
- Location of canopy

## SHADING ANALYSIS

ARRAY		ALL	kWh
January	61	61%	1,092
February	84	84%	1,237
March	96	96%	2,228
April	93	93%	1,950
May	96	96%	2,650
June	93	93%	2,138
July	96	96%	2,684
August	96	96%	2,511
September	96	96%	2,336
October	82	82%	1,656
November	70	70%	1,173
December	67	67%	899
Summer	93	93%	13,976
Winter	81	81%	8,580
<b>Annual SAV</b>	<b>88</b>	<b>88%</b>	<b>22,556</b>
<b>TSRF</b>	<b>85</b>	<b>85%</b>	

## PRODUCTION ESTIMATES

ARRAY		ALL	
Yield (unshaded)	1,220	1,220	kWh/kW/yr
Shading derate	88	88%	
Yield (shaded)	1,074	1,074	kWh/kW/yr
Azimuth	205°		
Tilt	10°		
Module count	75	75	
System size	21	21	kW STC
Annual energy	22,556	22,556	kWh +/-10%

PWatts derate factors	Default	Actual	PWatts Data Set
Soiling	0.98	0.98	Data: TMY3
Shading	0.97	0.88	Location ID: 722315
Snow	1.00	1.00	Latitude: 30.049999°
Mismatch	0.98	1.00	Longitude: -90.032997°
Wiring	0.98	0.98	Elevation: 3 m
Connections	0.995	0.995	
Light-induced degradation	0.985	0.985	
Nameplate rating	0.99	0.99	
Availability	0.97	0.97	
<b>Overall system derate</b>	<b>0.86</b>	<b>0.795</b>	
<b>Overall system losses</b>	<b>14%</b>	<b>20.5%</b>	
Inverter efficiency	96%	96.3%	



## 21 KW DC PV SYSTEM

### Option 1

75 280W Solar PV Panels  
Silfab: SLA280M

## CITY HALL CANOPY PROPOSAL

Poydras Street  
New Orleans, LA 70112

Production calculated using

## PWatts

[pwwatts.nrel.gov](http://pwwatts.nrel.gov)

## SYSTEM PERFORMANCE

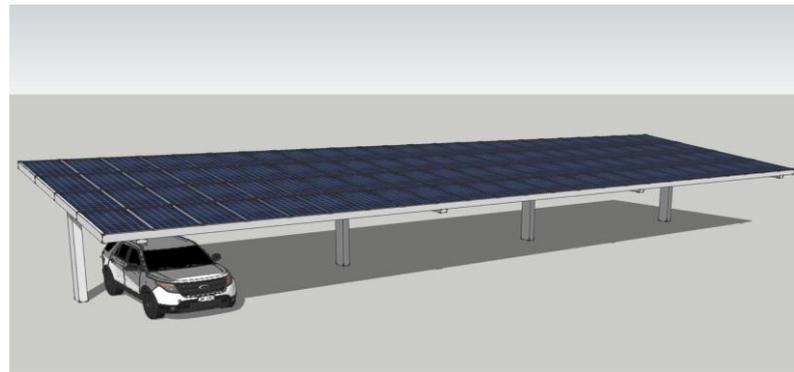
Sheet size: 8.5" x 11"  
Scale: Not to scale

## Key Points:

- Annual Production of 22,556 kWh
- Azimuth- 205°
- Tilt- 10°



**POYDRAS STREET VIEW**



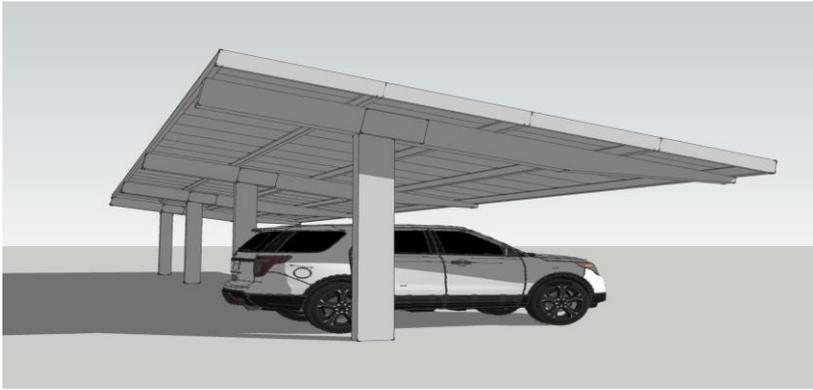
**CANOPY STAND-ALONE**



**POYDRAS AND LASALLE VIEW**



**BENSON TOWER VIEW**



VEHICLE MARKUP VIEW



POYDRAS STREET VIEW



SUPERDOME VIEW



LASALLE STREET VIEW





## Placement of Electrical Equipment On Existing Freight Elevator



**ELECTRICAL PANELS AND INVERTERS ON BACK OF ELEVATOR VIEW**



**CONDUIT ON BACK ENTRANCE**

## Conduit Transition to Building Entrance



**ELECTRICAL CONDUIT TRANSITIONING ON SIDE WALL NEAR REAR ENTRANCE**



**CONDUIT ON BACK ENTRANCE TO BASEMENT**

# CITY SOLAR PRODUCTION DISPLAY AND STATISTICAL ANALYSIS



48" DISPLAY PANEL AT MAIN ENTRANCE ON THE LEFT SIDE WALL





**MONOCRYSTALLINE PV MODULE**



**SLA-M 260/265/270/275/280/285/290**

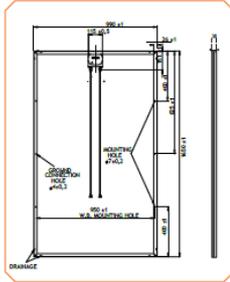
The Silfab SLA-M 60-cell monocrystalline modules are ideal for ground-mount, roof-top and solar tracking installations where maximum power density is required.

**Maximum Efficiency...** 60 of the highest efficiency, best quality monocrystalline cells result in a maximum power rating of 290 Wp.

**Positive Tolerance...** (-0/+5W) module sorting achieves the maximum electrical performance of the PV system.

**Highest Automation...** Strict quality controls during each step of the world's most automated module production facilities.

**Increased Quality...** Top quality materials and 100% EL testing guarantee a trustworthy 25-year performance warranty.



Electrical Specifications - Standard Test Conditions	SLA260M	SLA265M	SLA270M	SLA275M	SLA280M	SLA285M	SLA290M	
Module Power (P <sub>max</sub> )	Wp	260	265	270	275	280	285	290
Maximum power voltage (V <sub>pmx</sub> )	V	30.8	31.0	31.2	31.4	31.7	32.0	32.4
Maximum power current (I <sub>pmx</sub> )	A	8.49	8.55	8.65	8.76	8.83	8.91	8.97
Open circuit voltage (V <sub>oc</sub> )	V	37.8	38.0	38.2	38.4	38.7	39.1	39.6
Short circuit current (I <sub>sc</sub> )	A	9.04	9.11	9.22	9.32	9.40	9.47	9.54
Module efficiency	%	15.9	16.2	16.5	16.8	17.1	17.4	17.8
Maximum system voltage (VDC)	V	1000						
Series fuse rating	A	15						
Power tolerance	Wp	-0/+5						
Measurement conditions: STC 1000 W/m <sup>2</sup> • AM 1.5 • Temperature 25 °C • Measurement uncertainty ± 3% • Sun simulator calibration with module calibrated by Fraunhofer ISE.	Electrical characteristics may vary by 0% and power by -0/+5W.							
<b>Temperature Coefficients</b>	<b>SILFAB SLA Mono</b>							
Temperature Coefficient I <sub>sc</sub>	%/K	0.03						
Temperature Coefficient V <sub>oc</sub>	%/K	-0.30						
Temperature Coefficient P <sub>max</sub>	%/K	-0.38						
NOCT (± 2°C)	°C	45						
Operating temperature	°C	-40/+55						
<b>Mechanical Properties and Components</b>	<b>SILFAB SLA Mono</b>							
Module weight (± 1 kg)	kg	19						
Dimensions (P x L x D; ± 1mm)	mm	1650 x 990 x 38						
Maximum surface load (wind/snow)*	N/m <sup>2</sup>	5400						
Hail impact resistance		ø 25 mm at 83 km/h						
Cells		60 - Si monocrystalline - 3 busbar - 156 x 156 mm						
Glass		3.2 mm high transmittance, tempered, antireflective coating						
Encapsulant		PD-resistant EVA						
Backsheet		Multilayer polyester-based						
Frame		Anodized Al						
Bypass diodes		6 diodes-45V/12A						
Cables and connectors*		1300 mm ± 5.7 mm (4 mm), IEC4 comparable						
<b>Warranties</b>	<b>SILFAB SLA Mono</b>							
Module warranty		12 years						
Guaranteed power		≥ 97% end of 1 <sup>st</sup> year ≥ 90% end of 12 <sup>th</sup> year ± 0.5% end of 25 <sup>th</sup> year						
<b>Certifications</b>	<b>SILFAB SLA Mono</b>							
Product		ULC ORD C1703, UL 1703, IEC 61215, IEC 61730, CEI listed						
Factory		Product traceability ISO 9001:2008						

Also available as... **Silfab Smart Module**

Optimized by: **Tigo** energy



**SIMPLI PHI YOUR POWER WITH THE PHI 3.4™ SMART-TECH BATTERY**



The PHI3.4™ deep-cycle Lithium Ferro Phosphate (LFP) battery is optimized with proprietary cell architecture, power electronics, BMS and assembly methods. It is modular, lightweight and scalable for installations that range from kWh to MWh. Provides power security and seamless integration of renewable and traditional sources of energy in conjunction with or independent of the grid: net zero, peak shaving, emergency back-up, portable and mobile.

- Built-in accessible 80 Amp DC breaker On/Off switch - increases safety and simplifies installations
- 24V and 48V LFP batteries with proprietary architecture and Battery Management System (BMS)—do not require ventilation, cooling or thermal regulation
- Compatible with all industry standard inverter/charger controllers
- Drop in replacement for lead acid
- LFP is the safest, most environmentally benign Lithium Ion chemistry available—no risk of thermal runaway or fire
- No AC or toxic liquid cooling—nominal parasitic drain—long cycle life
- Non-toxic and non-hazardous recyclable materials
- Approved CA SGIP Advanced Energy Storage (AES) rebate program supplier

**PHI3.4™ 24V 48V**

DC Voltages - Nominal	24.6	51.2
Amp Hours	134	67
Wh Capacity	3,440	
Max Output Capacity	60 Amps	
Max Charge Current	45 Amps	33 Amps
DC Voltage Range	20 to 28.8	40 to 57.6
Depth of Discharge	up to 100%	
Operating Efficiency	98%	
Operating Temp	-4° to 140°F (-20° to 60°C)	
Charge Temp	32° to 120°F (0° to 49°C)	
Self-Discharge Rate	<1% loss per month	
Cycle Life	10,000+	
Memory Effect	None	
Warranty Period	10 Years	
Dimensions	13.5 x 14 x 8 inches / 0.88 cu ft. (34.29 x 35.56 x 20.32 cm / 0.025 m <sup>3</sup> )	
Weight	75.5 lbs (34.8 kg)	

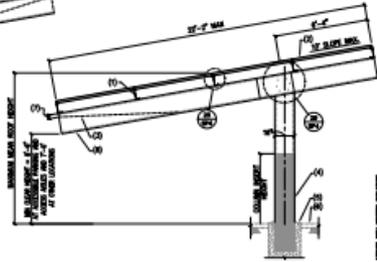
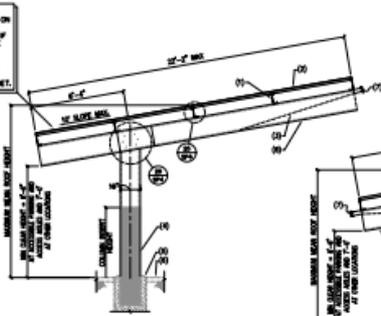
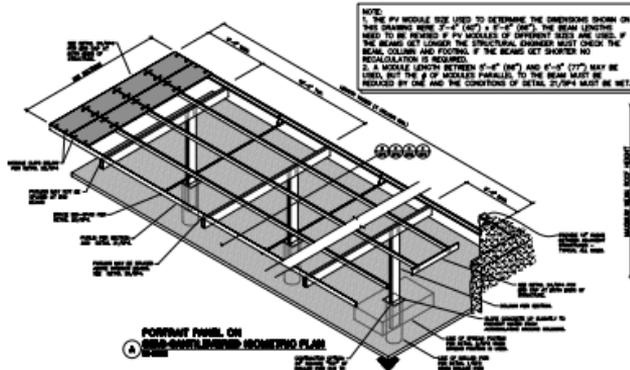


- Meets transport safety weight requirements: Less than 35 kg including packaging
- UN 3481 Lithium Ion battery contained in equipment, 3, II
- UL and CE listed, UN/DOT and RoHS compliant components
- Designed and built in California, USA

**Power. On Your Terms.™**



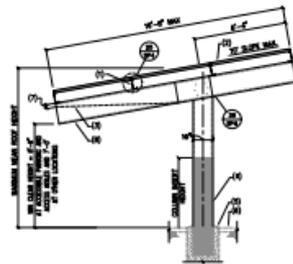
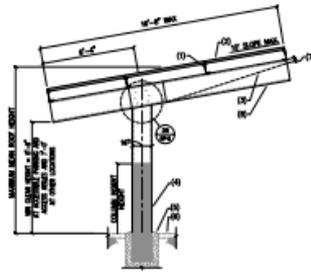
420 Bryant Circle | Ojai, CA 93023, USA | +1 (805) 640-6700 | [SimplePower.com](mailto:SimplePower.com)



MEMBER TYPE	3 PANELS 14'-0" / 4 PURLINS 105 MPH / EXPOSURE C	4 PANELS 22'-0" / 6 PURLINS 105 MPH / EXPOSURE C
BEAM SIZE		
MAX. BEAM ROOF HEIGHT		
COLUMN SIZE		

**TABLE OF BEAM AND COLUMN SIZES**  
on site.

**NOTE: NO WELD IS REQUIRED AT END OF COLUMN WHERE THE COLUMN CONNECTS WITH THE BEAM AND NO WELD IS REQUIRED AT THE END OF THE BEAM WHERE THE PURLIN CLIP OCCURS.**



- SECTION NOTES:**
- PURLIN - SEE DETAIL 21/2P-4.
  - SOLAR PANEL.
  - TAPERED BEAM - SEE DETAIL 20/2P-4.
  - COLLUM - SEE TABLE OF BEAM AND COLUMN SIZES THIS SHEET.
  - FOOTING - SEE FOUNDATION SCHEDULE AND DETAILS 1 AND 2 ON SHEET SPL.
  - FOOTING GRADE OR ASPHALT OR CONCRETE SLAB/PAVEMENT - SEE SITE PLAN.
  - 3" MIN. AT TAPERED BEAM.
  - BEAMS MAY BE STRAIGHT OR TAPERED.

NO STEEL DECK OR SHEATHING IS TO BE PLACED ON THE STRUCTURE NOW OR IN THE FUTURE.

**PRE-CHECK (PC) DOCUMENT**  
CODE: 2013-CBC  
A SEPARATE PROJECT APPLICATION FOR CONSTRUCTION IS REQUIRED

CSA APP. NO. 02-11308

12-1000  
TLP EWH/PGS  
12/3/14  
00-000

**CARUSO TURLEY SCOTT INC.**  
Structural Engineer  
Professional Engineer  
No. 0000000000  
1000 Main Street  
Suite 100  
San Francisco, CA 94102  
415.774.1234

**ORION SOLAR RACKING**  
We Make Solar Installation Simple

NO STEEL DECK OR SHEATHING IS TO BE PLACED ON THE STRUCTURE NOW OR IN THE FUTURE.

NO PRELIMINARY CONSTRUCTION PERMITS ARE TO BE OBTAINED AT ANY TIME.

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## Posigen Logo Banner on Poydras Street Front Parking Garage



POYDRAS STREET VIEW POSIGEN SIGN



AERIAL VIEW OF SOLAR SYSTEM

PANEL VIEW



LOYOLA STREET VIEW OF SOLAR CANOPY

PANEL VIEW